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North Carolina Department of Transportation
Planning and Research Branch
Statewide Planning

Tabor City Thoroughfare Plan

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THOROUGHFARE PLAN
FOR THE
TOWN OF TABOR CITY

Prepared by the:
Thoroughfare Planning Unit
Statewide Planning Group
Planning and Research Branch
Division of Highways
North Carolina Department of Transportation

In Cooperation with:
The Town of Tabor City
The Federal Highway Administration
U.S. Department of Transportation

March, 1990

NORTH CAROLINA PROFESSIONAL SEAL PE 7483 ENGINEER JAMES T. NEWHAM, JR.

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ACKNOWLEDGMENTS

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A special note of appreciation to the Tabor City Chamber of Commerce and the Yam Festival Committee for permission to use the Yam Man on the front cover.

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I. INTRODUCTION

The Town of Tabor City is located in Columbus County, approximately eighteen miles south of Whiteville in southeastern North Carolina. Tabor City borders South Carolina to the southwest and is located about thirty miles from the North Carolina coast. Cherry Grove and North Myrtle Beach, South Carolina beaches that attract tourists from areas throughout the United States, are only thirty minutes from Tabor City.

Tabor City, formerly known as the "Yam Capital of the World," continues to celebrate the yam each year during the Yam Festival. Festivities include arts and crafts, cheerleader and band contests, antique car show, free entertainment, a parade, and the Yam Ball.

There are many and varied benefits to be derived from thoroughfare planning, but the primary objective is to enable the urban street system to be progressively developed in a manner which will adequately service future traffic demands in the Tabor City area. In addition, the thoroughfare plan should embody those details of accepted thoroughfare planning principles. Major and minor thoroughfares were located based on field investigation, aerial photos, existing and anticipated land uses, and topographic conditions.

Some of the major benefits to be derived from thoroughfare planning are:

(a) A minimum amount of land will be required for street and highway purposes.

(b) Local citizens will know which streets will be developed as major thoroughfares and thus will have assurance that their residential street will not one day become a major traffic carrier.

(c) Land developers will be able to design their subdivisions so that subdivision streets will function in a non-conflicting manner with the overall plan.

It should be emphasized that the recommended plan is based on anticipated growth of the urban area as indicated by current trends. Prior to construction of specific projects, a more detailed study will be required to reconsider development trends and to determine specific locations and design requirements.

II. THOROUGHFARE PLANNING PRINCIPLES

Objectives

Typically, the urban street system occupies 25 to 30 percent of the total developed land in an urban area. Since the system is permanent and expensive to build and maintain, much care and foresight are needed in its development. Thoroughfare planning is the process public officials use to assure the development of the most appropriate street system that will meet existing and future travel desires within the urban area.

The primary aim of a thoroughfare plan is to guide the development of the urban street system in a manner consistent with the changing traffic patterns. A thoroughfare plan will enable street improvements to be made as traffic demands increase, and it helps eliminate unnecessary improvements, so needless expense can be averted. By developing the urban street system to keep pace with increasing traffic demands, a maximum utilization of the system can be attained, requiring a minimum amount of land for street purposes. In addition to providing for traffic needs the thoroughfare plan should embody those details of good urban planning necessary to present a pleasing and efficient urban community. The location of present and future population, commercial, and industrial development affects major street and highway locations. Conversely, the location of major streets and highways within the urban area will influence the urban development pattern.

Other objectives of a thoroughfare plan include:

1. providing for the orderly development of an adequate major street system as land development occurs,

2. reducing travel and transportation costs,

3. reducing the cost of major street improvements to the public through the coordination of the street system with private action,

4. enabling private interests to plan their actions, improvements, and development with full knowledge of public intent,

5. minimizing disruption and displacement of people and businesses through long range advance planning for major street improvements,

6. reducing environmental impacts, such as air pollution, resulting from transportation, and

7. increasing travel safety.

Thoroughfare planning objectives are achieved through both improving the operational efficiency of thoroughfares, and improving the system efficiency through system coordination and layout.

Operational Efficiency

A street's operational efficiency is improved by increasing the capability of the street to carry more vehicular traffic and people. In terms of vehicular traffic, a street's capacity is defined by the maximum number of vehicles which can pass a given point on a roadway during a given time period under prevailing roadway and traffic conditions. Capacity is affected by the physical features of the roadway, nature of traffic, and weather.

Physical ways to improve vehicular capacity include street widening, intersection improvements, improving vertical and horizontal alignment, and eliminating roadside obstacles. For example, widening of a street from two to four lanes more than doubles the capacity of the street by providing additional maneuverability for traffic. This reduces the impedances to traffic flow caused by slow moving or turning vehicles and the adverse effects of horizontal and vertical alignments.

Operational ways to improve street capacity include:

1. Control of access -- A roadway with complete access control can often carry three times the traffic handled by a non-controlled access street with identical lane width and number.

2. Parking removal -- Increases capacity by providing additional street width for traffic flow and reducing friction to flow caused by parking and unparking vehicles.

3. One-way operation -- The capacity of a street can sometimes be increased 20-50%, depending upon turning movements and overall street width, by initiating one-way traffic operations. One-way streets can also improve traffic flow by decreasing potential traffic conflicts and simplifying traffic signal coordination.

4. Reversible lanes -- Reversible traffic lanes may be used to increase street capacity in situations where heavy directional flows occur during peak periods.

5. Signal phasing and coordination -- Uncoordinated signals and poor signal phasing restrict traffic flow by creating excessive stop-and-go operation.

Altering travel demand is a third way to improve the efficiency of existing streets. Travel demand can be reduced or altered in the following ways:

1. Encourage people to form carpools and vanpools for journeys to work and other trip purposes. This reduces the number of vehicles on the roadway and raises the people carrying capability of the street system.

2. Encourage the use of transit and bicycle modes.

3. Encourage industries, businesses, and institutions to stagger work hours or establish variable work hours for employees. This will spread peak travel over a longer time period and thus reduce peak hour demand.

4. Plan and encourage land use development or redevelopment in a more travel efficient manner.

System Efficiency

Another means for altering travel demand is the development of a more efficient system of streets that will better serve travel desires. A more efficient system can reduce travel distances, time, and cost to the user. Improvements in system efficiency can be achieved through the concept of functional classification of streets and development of a coordinated major street system.

Functional Classification

Streets perform two primary functions -- traffic service and land service, which when combined, are basically incompatible. The conflict is not serious if both traffic and land service demands are low. However, when traffic volumes are high, conflicts created by uncontrolled and intensely used abutting property leads to intolerable traffic flow friction and congestion.

The underlying concept of the thoroughfare plan is that it provides a functional system of streets which permits travel from origins to destinations with directness, ease, and safety. Different streets in the system are designed and called on to perform specific functions, thus minimizing the traffic and land service conflict. Streets are categorized as to function as local access streets, minor thoroughfares, or major thoroughfares (See Figure 1).

Local Access Streets provide access to abutting property. They are not intended to carry heavy volumes of traffic and should be located such that only traffic with origins and destinations of the streets would be served. Local streets may be further classified as either residential, commercial, and/or industrial depending upon the type of land use which they serve.

Minor Thoroughfares are more important streets on the city system. They collect traffic from local access streets and carry it to the major thoroughfares. They may in some instances supplement the major thoroughfare system by facilitating minor through traffic movements. A third function that may be performed is that of providing access to abutting property. They should be designed to serve limited areas so that their development as major thoroughfares will be prevented.

Major Thoroughfares are the primary traffic arteries of the city. Their function is to move intra-city and inter-city traffic. The streets which comprise the major thoroughfare system may also serve abutting property, however, their principle function is to carry traffic. They should not be bordered by uncontrolled strip development because such development significantly lowers the capacity of the thoroughfare to carry traffic and each driveway is a danger and an impediment to traffic flow. Major thoroughfares may range from a two-lane street carrying minor traffic volumes to major expressways with four or more traffic lanes. Parking normally should not be permitted on major thoroughfares.

Idealized Major Thoroughfare System

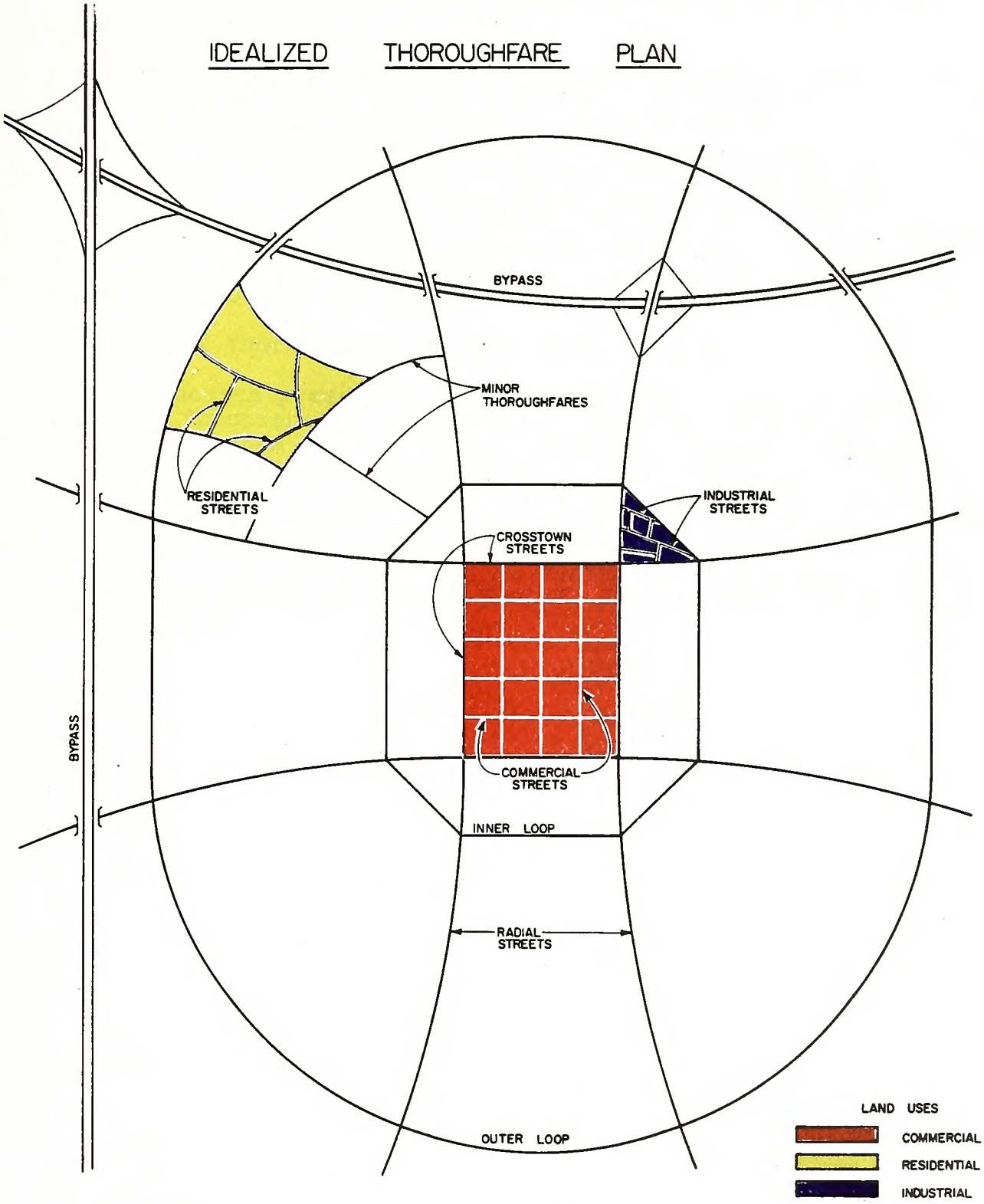
A coordinated system of major thoroughfares forms the basic framework of the urban street system. A major thoroughfare system which is most adaptable to desire lines of travel within an urban area is the radial-loop system. It permits movement between various areas of the city within maximum directness. This system consists of several functional elements--radial streets, crosstown streets, loop system streets, and bypasses (Figure 1).

Radial streets provide for traffic movement between points located on the outskirts of the city and the central area. This is a major traffic movement in most cities, and the economic strength of the central business district depends upon the adequacy of this type of thoroughfare.

If all radial streets crossed in the central area, an intolerable congestion problem would result. To avoid this problem, it is very important to have a system of crosstown streets which form a loop around the central business district. This system allows traffic moving from origins on one side of the central area to destinations on the other side to follow the area's border. It also allows central area traffic to circle and then enter the area near a given destination. The effect of a good crosstown system is to free the central area of crosstown traffic, thus permitting the central area to function more adequately in its role as a business or pedestrian shopping area.

Loop system streets move traffic between suburban areas of the city. Although a loop may completely encircle the city, a typical trip may be from an origin near a radial thoroughfare to a destination near another radial thoroughfare. Loop streets do not

FIGURE 1


IDEALIZED THOROUGHFARE PLAN
BYPASS
MINOR THOROUGHFARES
RESIDENTIAL STREETS
INDUSTRIAL STREETS
CROSSTOWN STREETS
BYPASS
COMMERCIAL STREETS
INNER LOOP
RADIAL STREETS
OUTER LOOP
LAND USES
COMMERCIAL
RESIDENTIAL
INDUSTRIAL

necessarily carry heavy volumes of traffic, but they function to help relieve central areas. There may be one or more loops, depending on the size of the urban area. They are generally spaced one-half mile to one mile apart, depending on the intensity of land use.

A bypass is designed to carry traffic through or around the urban area, thus providing relief to the city street system by removing traffic which has no desire to be in the city. Bypasses are usually designed to through-highway standards, with control of access. Occasionally, a bypass with low traffic volume can be designed to function as a portion of an urban loop. The general effect of bypasses is to expedite the movement of through traffic and to improve traffic conditions within the city. By freeing the local streets for use by shopping and home-to-work traffic, bypasses tend to increase the economic vitality of the local area.

Application of Thoroughfare Planning Principles:

The concepts presented in the discussion of operational efficiency, functional classification, and idealized major thoroughfare system are the conceptual tools available to the transportation planner in developing a thoroughfare plan. In actual practice, a thoroughfare plan is developed for established urban areas and is constrained by the existing land use and street patterns, existing public attitudes and goals, and current expectations of future land use. Compromises must be made because of these constraints and the many other factors that affect major street locations.

III. EXISTING FACILITIES

Major Routes

Tabor City is served primarily by US 701 which provides access from the north and south. The Town is also served by NC 904 from the east and west and NC 410 from the north and south. US 701 Bypass borders eastern Tabor City and is lined with industrial land use. Other streets are residential, with commercial development downtown, and along US 701 Business. All routes in Tabor City are currently two lane. US 701 Business has potential to be restriped as a three lane facility through the commercial development. The downtown has angle parking and parallel parking.

Population Trends

Travel is directly related to population although in Tabor City there is a large percentage of travel which originates outside the immediate area. Population trends and projections for Tabor City, South Williams Township, and Columbus County are shown in Table 1 below:

Population Trends and Projections

Year	Columbus Co.	South Williams Township	Tabor City
1940	45,663	3,881	1,552
1950	50,621	5,318	2,033
1960	48,973	4,828	2,338
1970	46,937	4,895	2,400
1980	51,037	5,241	2,710
1988	53,106[1]	5,576[2]	2,844[3]
1990	53,546[1]	5,622[2]	2,867[3]
2000	55,151[1]	5,791[2]	2,953[3]
2010	55,737[1]	5,852[2]	2,985[3]
2015	56,156[1]	5,896[2]	3,007[3]
2020	56,578[1]	5,941[2]	3,030[3]

[1]Projections for Columbus County taken from Office of State Budget and Management, State of North Carolina, 1988.

[2]South Williams Township projections assumed the same percent in population of Columbus County.

[3]Tabor City projections assumed the same rate of percentage in population of South Williams Township, and does not take into account future annexations.

TABLE 1

As shown in Table 1, rapid increase in Tabor City's population is not expected. However, traffic in and through Tabor City will continue to grow over the next thirty years. US 701 Bypass will need improvements to handle additional industrial development. The downtown area will also have congestion problems if alternative routes are not planned for and constructed.

Economy and Employment

As with many rural areas of North Carolina, agriculture plays an important roll in Tabor City's economic base. Sweet potatoes and tobacco are the principle crops in the area. Other major industries in the area include lumber and textiles.

Included in this report is the Official Zoning Jurisdictions for the Town of Tabor City (Figure 1-A). This figure shows the official zoning district as well as the location of the proposed thoroughfares.

Travel Demand

Travel demand is generally reported in the form of average daily traffic counts. Traffic counts are taken regularly at several locations in and around Tabor City by the North Carolina Department of Transportation. To estimate future travel demand, traffic trends over the past eighteen years were studied.

A comparison of annual growth rates from 1970 to 1988 at various count locations in Tabor City shows average annual growth rates ranging from 0% to 5%. The largest growth was noted on US 701 Bypass and US 701 Business. Appendix A and Figures 2 and 3 show existing and expected average traffic volumes based on growth rates of 2.5% (moderate growth) to 3.5% (high growth). The reason this is used instead of the past growth rates is because these projections are being made for twenty-five and thirty years. It is very difficult for an area to sustain a annual growth rate over four percent. Likewise, it is uncommon for an area to maintain a growth rate less than two percent.

Traffic Accidents

Traffic accident analysis is a serious and important consideration in a thoroughfare plan development. The source of traffic accidents can be broken down into three general categories. The first is the physical environment which includes such things as road condition, weather, road obstructions, and traffic conditions. The second source is associated with the driver. This includes the driver's mental alertness, distractions in the car, ability to handle the vehicle, and reaction time. The third source is associated with the physical attributes of the vehicle itself. This would include such things as the condition

of the brakes and tires, vehicle responsiveness, size of the vehicle, and how well the windshield wipers and defroster work. All traffic accidents can be attributed to one or more of these sources; however, the driver is often the primary source.

Accident data for September 1985 through September 1989 was studied as part of the development of this report. There were no major accident problems in the Tabor City area. The largest accident count for a single intersection in Tabor City was found on US 701 at the intersection of the business route and the bypass. For other accident locations see Table 2.

Tabor City Selected Accident Inventory
(September 1985 - September 1989)

Location	Number of Accidents
US 701 Bypass @ US 701 Business	9
US 701 Bypass @ Pireway Road	8
Fifth Street @ Lewis Street	5
Fifth Street @ Main Street	5

TABLE 2

Capacity Analysis

A good indication of the adequacy of the existing major street system is a comparison of the traffic volumes with the ability of the streets to move traffic freely at a desirable speed. The ability of a street to move traffic freely, safely, and efficiently with a minimum delay is controlled principally by the spacing of major devices utilized. Thus, the ability of a street to move traffic can be increased by restricting parking and turning movements, using proper sign and signal devices, and by the application of other traffic engineering techniques.

Capacity is defined as the maximum number of vehicles which has a reasonable expectation of passing over a given section of a roadway in one direction, or in both directions, during a given time period under prevailing roadway and traffic conditions.[1] The relationship of traffic volumes to the capacity of the roadway will determine **level of service** being provided. Six levels of service have been selected to identify the conditions existing under various speed and volume conditions on a highway or street.

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[1] Highway Capacity Manual, Special Report 209, 1985, p. 1-3.

The six levels of service are illustrated in Figure 3, and they are defined on the following pages. The definitions are general and conceptual in nature, but may be applied to urban arterial level of services. Levels of service for interrupted flow facilities vary widely in terms of both the user's perception of service quality and the operational variables used to describe them. Each chapter of the 1985 Highway Capacity Manual contains more detailed descriptions of the levels of service as defined for each facility type.

1. **Level-of-service A** describes primarily free flow-operations at average travel speeds usually about 90 percent of the free flow speed for the arterial class. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.

2. **Level-of-service B** represents reasonable unimpeded operations at average travel speeds usually about 70 percent of the free flow speed for the arterial class. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome. Drivers are not generally subjected to appreciable tension.

3. **Level-of-service C** represents stable operations. However, ability to maneuver and change lanes in midblock locations may be more restricted than in LOS B, and longer queues and/or adverse signal coordinations may contribute to lower average travel speeds of about 50 percent of the average free flow speed for the arterial class. Motorists will experience an appreciable tension while driving.

4. **Level-of-service D** borders on a range on which small increases in flow may cause substantial increases in approach delay and, hence, decreases in arterial speed. They may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these. Average travel speeds are about 40 percent of free flow speed.

5. **Level-of-service E** is characterized by significant approach delays and average travel speeds of one-third the free flow speed or lower. Such operations are caused by some combination of adverse progression, high signal density, extensive queuing at critical intersections, and inappropriate signal timing.

6. **Level-of-service F** characterizes arterial flow at extremely low speeds below one-third to one-quarter of the free flow speed. Intersection congestion is

likely at critical signalized locations, with high approach delays resulting. Adverse progression is frequently a contributor to this condition.

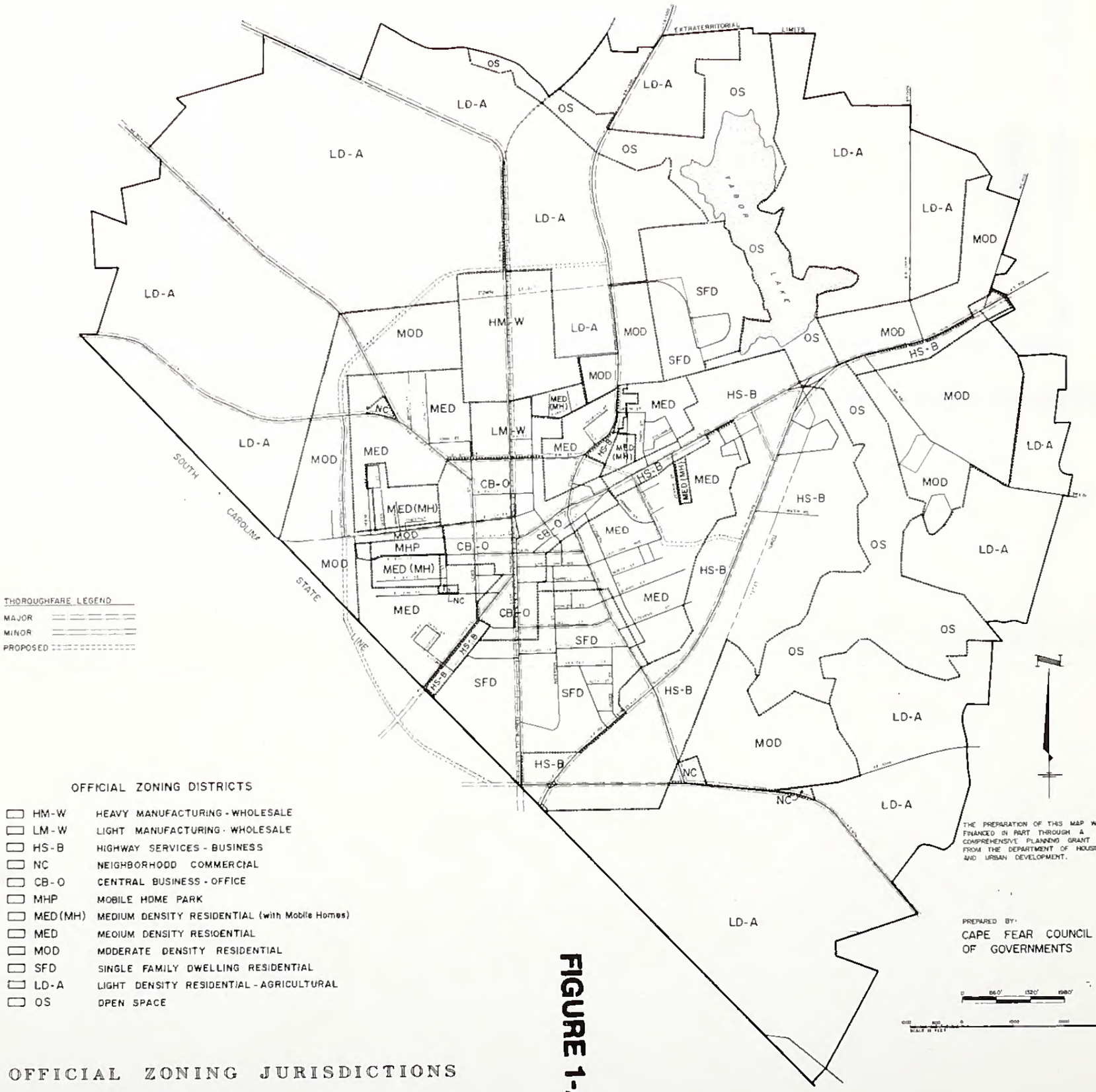
The recommended improvements and overall design of the Thoroughfare Plan were based on achieving a minimum of LOS D on existing facilities, and LOS C on new facilities. LOS D is considered the **"practical capacity"** of a facility, or that at which the public begins to express dissatisfaction.

There are several locations in the Tabor City area that will experience capacity problems in the future. The most notable congestion problems will occur on US 701 Bypass. A four-lane cross-section with median crossings provided, will alleviate congestion problems on this facility.

Another facility that will experience problems in the future is Pireway Road. It will be especially congested at the intersection with US 701 Business. This intersection will need a turn lane to handle the left turns onto Fifth Street. The extension of Eighth Street to US 701 Business and more importantly the extension of Williams Street to US 701 Bypass will help alleviate congestion on Pireway Road, by becoming an alternative route to US 701 Bypass.

Other facilities in the area are not expected to have congestion problems. However, it is recommended that many of the facilities, with less than 24 feet of pavement, be widened to allow for 12 feet lanes.

TABOR CITY, NORTH CAROLINA



OFFICIAL ZONING DISTRICTS

☐	HM-W	HEAVY MANUFACTURING - WHOLESALE
☐	LM-W	LIGHT MANUFACTURING - WHOLESALE
☐	HS-B	HIGHWAY SERVICES - BUSINESS
☐	NC	NEIGHBORHOOD COMMERCIAL
☐	CB-O	CENTRAL BUSINESS - OFFICE
☐	MHP	MOBILE HOME PARK
☐	MED(MH)	MEDIUM DENSITY RESIDENTIAL (with Mobile Homes)
☐	MED	MEDIUM DENSITY RESIDENTIAL
☐	MOD	MODERATE DENSITY RESIDENTIAL
☐	SFD	SINGLE FAMILY DWELLING RESIDENTIAL
☐	LD-A	LIGHT DENSITY RESIDENTIAL - AGRICULTURAL
☐	OS	OPEN SPACE

THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A COMPREHENSIVE PLANNING GRANT FROM THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.

PREPARED BY:
CAPE FEAR COUNCIL OF GOVERNMENTS

OFFICIAL ZONING JURISDICTIONS

FIGURE 1-A

REVISED TO 1 JANUARY 1990

FIGURE 2

LEGEND

0000 1988 ADT

1988 TRAFFIC COUNTS

Town of

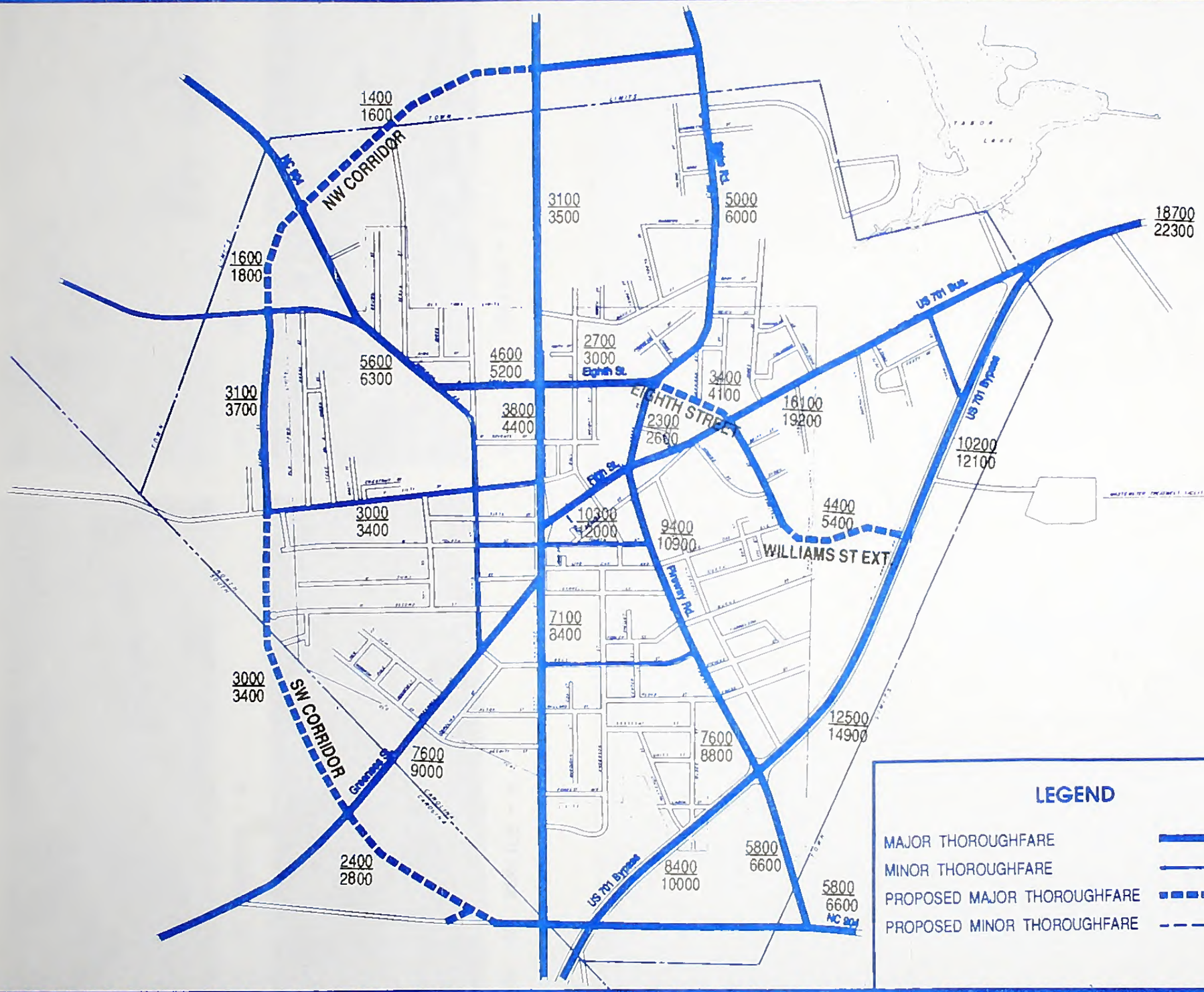
TABOR CITY

Columbus County, North Carolina

SCALE

0 1000 2000 FEET

FIGURE 3



LEGEND

0000 2015 ADT
0000 2020 ADT

PROJECTED TRAFFIC COUNTS

Town of

TABOR CITY

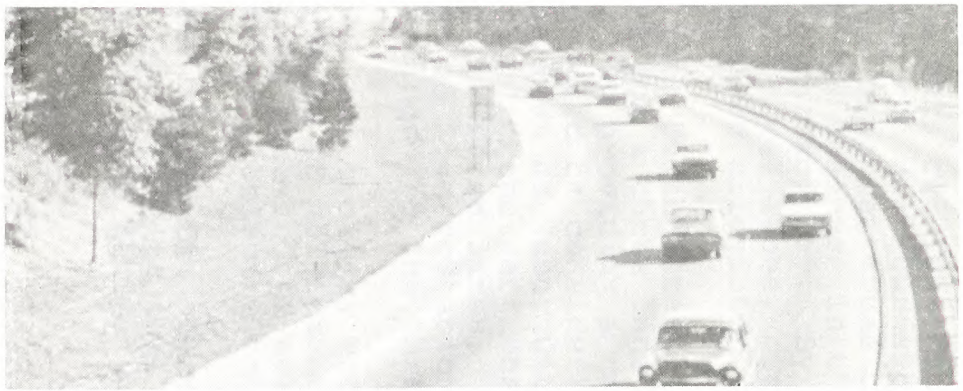
Columbus County, North Carolina

SCALE
0 1000 2000 FEET

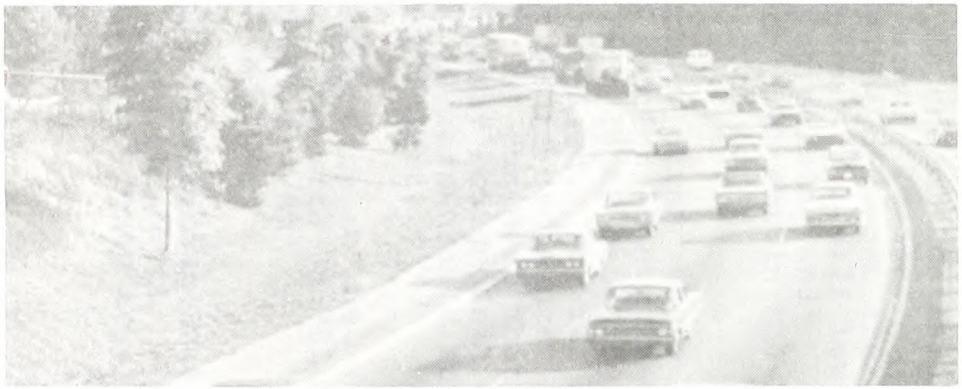
LEGEND

- MAJOR THOROUGHFARE
- MINOR THOROUGHFARE
- PROPOSED MAJOR THOROUGHFARE
- PROPOSED MINOR THOROUGHFARE

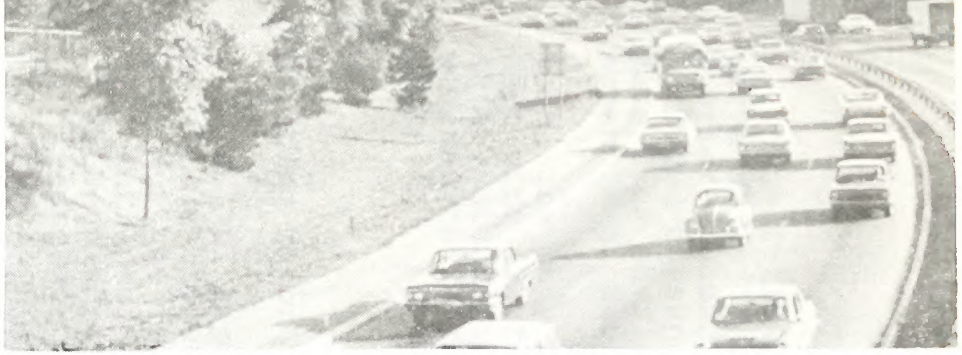
LEVEL OF SERVICE - A



LEVEL OF SERVICE - B



LEVEL OF SERVICE - C



LEVEL OF SERVICE - D

LEVEL OF SERVICE - E

LEVEL OF SERVICE - F

LEVELS OF SERVICE

FIGURE 4

IV. RECOMMENDATIONS

The following is a list of roads that are recommended to serve as major and minor thoroughfares as discussed in Chapter II. A brief discussion of the road's deficiencies and function is included to support its classification as a thoroughfare. More detail on physical and operational characteristics is given in Appendix A, Table 4.

There are many 2-lane facilities in the area that are less than 24 feet wide (12 feet lanes). It is desirable from an operations and safety standpoint that roads with less than 24 feet of pavement be widened to 24 feet. These facilities are given in Appendix A, Table 4.

Major Thoroughfares

Existing major thoroughfares include:

US 701 Bypass - The US 701 Bypass is a two lane facility that cuts through the eastern edge of the planning area. Care must be taken in the future not to allow excess driveway entrances along this highway. It is projected that within the planning period this facility will need widening to increase capacity. Currently there is adequate right-of-way to allow a five lane cross section or a four lane divided urban boulevard (see Figure 6 for cross sections).

US 701 Business - This two lane facility is one of the main facilities serving the downtown shopping area. It also serves other major shopping areas outside the downtown area. Parking along US 701 Business in the downtown area will lower the capacity of this facility. By removing parking and adding additional travel lanes, congestion problems in the downtown area could be alleviated in the future.

For the section from Fifth Street to Waccamaw Street there is adequate pavement for a three lane cross section (centerlane for left turns). By providing a center turn lane, capacity for this section would be considerably increased. It will be necessary for the Town of Tabor City to pass an ordinance prohibiting parking in the sections of US 701 Business that will be designed for three lanes. The Roadway Design Unit of the NC Department of Transportation would be responsible for designing the markings for the three lane facility.

NC 410 - This two lane facility enters Tabor City at the state line intersects US 701 Business and runs with US 701 out of the planning area to the east. There are no foreseeable capacity problems along this facility.

NC 904 (Eighth St., Fifth St., Pireway Rd., & Watering St.) - NC 904 is a two lane facility that runs along the North Carolina / South Carolina border and is a major route to

North Carolina beaches. This route runs from the northwest border of Tabor City to the southeast City Limits. This facility is very important for travel between residential areas and the commercial and industrial development along US 701 Bypass. The intersection of Pireway Road and Fifth Street will experience congestion problems in the future. It is desirable that left turn lanes be provided at this intersection. Also, sections south of Bell Street should be widened to twelve feet lanes, and ultimately three lanes.

Stake Road - This two lane facility serves the northern residential section of Tabor City. There are no capacity problems on this facility but it should be widened to twenty-four feet north of SR 1367.

SR 1304, SR 1305, and Eighth Street - There are no foreseeable capacity problems on these facilities in the future. It is recommended, however, that they be widened to twelve feet lanes.

Proposed new or improved major thoroughfares include:

Eight Street, and Williams Street Extension - The two lane extension of Eight Street to US 701 Business and the extension of Williams Street to US 701 will allow easy access to the business areas located on US 701 from the major residential areas in Tabor City. It will also help to alleviate congestion on Pireway Road and the intersection of Pireway Road and Fifth Street.

Northwest Corridor - A proposed two lane facility that will run from SR 1304 to NC 904 (beginning at SR 1306) and continue to SR 1303 (ending at School Street). This facility will allow easy movement between the northern and western areas of Town.

Southwest Corridor - A proposed two lane facility that will run from Sixth Street to Greensea Street and continuing to SR 1305. This facility will allow easier movement between the southern and western area of Tabor City.

School Street (SR 1302), and SR 1306 - These two lane facilities should be widened to twelve feet lanes. This is especially necessary if these facilities are to be used as part of the Northwest and Southwest Corridors.

The combination of the Northwest and Southwest Corridors in conjunction with School Street and SR 1306 will create a continuous north/south loop that will allow commuters to travel between the northern and southern areas of the planning area without adding congestion to the downtown area.

Minor Thoroughfares

Existing minor thoroughfares include:

Bell Street, Fourth Street, Lewis Street, SR 1303, and West Sixth Street - These are two lane facilities that collect traffic from local access street and feed traffic into the major thoroughfare. There are no foreseeable capacity problems on these facilities during the planning period.

There are no proposed minor thoroughfares for the Tabor City area. The facilities designated as minor thoroughfare are adequate to serve the area by getting traffic to the major thoroughfares.

Construction Improvements and Cost Estimates

Construction priorities will vary depending on what criteria are considered and what weight is attached to the various criteria. Most people would agree that improvements to the major thoroughfare system and major traffic routes would be more important than minor thoroughfares where traffic volumes are lower. To be in the States Transportation Improvement Program, a project must show favorable benefits relative to costs and should not be prohibitively disruptive to the environment. Based on these considerations the improvements shown in Table 3 were recommended.

Tabor City Thoroughfare Plan Cost Estimates - Benefits - and Probable Impacts

DESCRIPTION	LENGTH (mile)	CONST. COST	USER BENEFITS	ECONOMIC DEVELOPMENT	ENVIRONMENTAL IMPACTS POSITIVE	NEGATIVE
Eighth Street Ext	0.18	117				
Williams Street Ext	0.29	189				
Combined Benefits			67,272	0.90	0.50	0.75
Southwest Corridor	1.11	1,000	24,297	0.70	0.50	0.70
Northwest Corridor	0.88	800	21,324	0.70	0.60	0.55
US 701 Bypass	2.16	1,944	3,070	0.85	0.70	0.40

NOTE: AMOUNTS ARE IN $ X 1000

Table 3

LEGEND

- MAJOR THOROUGHFARE
- MINOR THOROUGHFARE
- PROPOSED MAJOR THOROUGHFARE
- PROPOSED MINOR THOROUGHFARE

ADOPTED BY:
TOWN OF TABOR CITY September 12, 1989

RECOMMENDED FOR APPROVAL BY:
NORTH CAROLINA DOT
PLANNING AND RESEARCH BRANCH
September 20, 1989 J. R. Hall

ADOPTED BY:
NORTH CAROLINA
BOARD OF TRANSPORTATION October 13, 1989

PUBLIC HEARING: September 12, 1989

FIGURE 5

August 17, 1989

THOROUGHFARE PLAN

for the

Town of

TABOR CITY

Columbus County, North Carolina

SCALE
0 1000 2000 FEET

V. ADMINISTRATIVE CONTROLS AND IMPLEMENTATION TOOLS

State and Municipal Adoption of the Thoroughfare Plan

Chapter 136, Article 3A, Section 136-66.2 of the General Statutes of North Carolina provides that after development of a thoroughfare plan, the plan may be adopted by the governing body of the municipality and the Department of Transportation to serve as the basis for future street and highway improvements. The General Statutes also require that, as part of the plan, the governing body of the municipality and Department of Transportation shall reach agreement on responsibilities for existing and proposed streets and highways included in the plan. Facilities which are designated a State responsibility will be constructed and maintained by the Division of Highways. Facilities which are designated a municipal responsibility will be constructed and maintained by the municipality.

After mutual plan adoption, the Department of Transportation will initiate negotiations leading to determining which of the existing and proposed thoroughfares will be a Department responsibility and which will be a municipal responsibility. Chapter 136, Article 3A, Section 136-66.1 of the General Statutes provides guidance in the delineation of responsibilities. In summary, these statutes provide that the Department of Transportation shall be responsible for those facilities which serve volumes of through traffic and traffic from outside the area to major business, industrial, governmental, and institutional destinations located inside the municipality. The municipality is responsible for those facilities which serve primarily internal travel.

Unless implementation is an integral part of the transportation planning process, the effort and expense associated with developing a plan is lost. To neglect the implementation process is a three-fold loss . . . . the loss of the capital expenditures used in developing a plan, the opportunity cost of the capital expenditures, and more importantly the loss of the benefits which would accrue from an improved transportation system.

Administrative controls and implementation tools which can aid in the implementation process are generally available to cities and municipalities through Federal and State Legislation. These controls and tools will be discussed in this chapter. They include: Subdivision Regulations, Zoning Ordinances, Official Maps, Urban Renewal, Capital Improvements Programs, and Development Reviews. Generally, two issues play a major role in the implementation process - available finances and citizen involvement. Effective use of the controls and tools listed above are indicative of good planning and minimize the effects of limited finances and negative citizen reaction to specific elements of a plan. It is through good planning that maximum use is made of every available dollar and that citizen involvement and approval of the transportation plan is obtained.

Available Controls and Tools

Subdivision Regulations

Subdivision regulations are locally adopted laws governing the process of converting raw land into building sites. From the planner's view, subdivision regulations are important at two distinct levels. First, they enable him to coordinate the otherwise unrelated plans of a great many individual developers. This process assures that provision is made for land development elements such as roadway right-of-way, parks, school sites, water lines and sewer outfalls, and so forth. Second, they enable him to control the internal design of each new subdivision so that its pattern of streets, lots, and other facilities will be safe, pleasant, and economical to maintain.

To be most effective, subdivision regulations and their administration must be closely coordinated with other local governmental policies and ordinances. Among the more important of these are the Comprehensive Growth Plan, Utilities Extension Master Plan, and Thoroughfare Plan.

In practice, subdivision regulations can provide some very positive benefits such as requiring portions of major streets to be constructed in accordance with the Thoroughfare Plan, or requiring subdividers to provide for the dedication and/or reservation of rights-of-way in advance of construction. These practices reduce the overall cost of the plan by having some costs borne by developers. Projects in Tabor City that could be implemented or protected by subdivision ordinances are Williams Street Extension, and the Northwest Corridor.

Recommended Subdivision Ordinances are included in Appendix B.

Zoning Ordinances

Zoning is probably the single most commonly used legal device available for implementing a community's land-use plan. To paraphrase the U.S. Department of Commerce 1924 Standard Zoning Enabling Act, on which most present-day legislation is based, zoning may be defined as the division of a municipality (or other governmental unit) into districts, and the regulation within the districts of:

1. the height and bulk of buildings and other structures,
2. the area of a lot which may be occupied and the size of required open spaces,
3. the density of population, and
4. the use of buildings and land for trade, industry, residence, or other purposes.

The characteristic feature of the zoning ordinance that distinguishes it from most other regulations is that it differs

from district to district, rather than being uniform throughout a city. Thus, a given area might be restricted to single-family residential development with minimum lot size requirements and setback provisions appropriate for development. In other areas, commercial or industrial development might be permitted, and regulations would be enacted to control such development. Building code provisions or sanitary regulations, on the other hand, normally apply to all buildings in a certain category regardless of where they may be situated within a city.

The zoning ordinance does not regulate the design of streets, utility installation, the reservation or dedication of parks, street rights-of-way, school sites, and related matters. These are controlled by subdivision regulations or possibly by use of an official map. The zoning ordinance should, however, be carefully coordinated with these and other control devices.

Official Maps

The roadway corridor official map (or official map) map is a document, adopted by the legislative body of the community, that pinpoints and preserves the location of proposed streets against encroachment. In effect, the official map serves notice on developers that the State or municipality intends to acquire certain specific property. The official map serves as a positive influence for sound development by reserving sites for public improvements in anticipation of actual need. The Eighth Street Extension and the Williams Street Extension are examples of proposed projects that could be protected by using an official map.

The NCDOT position is that it will limit the use of official maps to large scale, fully access controlled facilities planned for rapidly developing areas outside of municipal jurisdictions. For projects within municipal jurisdictions, official maps should be prepared and adopted by the local government. Municipalities may adopt official maps that extend beyond its extraterritorial jurisdiction with approval from the Board of County Commissioners.

It should be recognized that an official map places severe but temporary restrictions on private property rights. These restrictions are in the form of a prohibition, for up to three years, on the issuance of building permits or the approval of subdivisions on property lying within an official map alignment. The three year reservation period begins with the request for development approval. This authority should be used carefully and only in cases where less restrictive powers are found to be ineffective.

Requests for NCDOT to prepare and adopt an official map should be directed to the manager of the Program and Policy Branch. For cities contemplating the adoption of an official map, there are two ways in which the city may proceed. The first is to

consider the official map statute as a stand-alone authority and use it as the basis for local adoption of an official map. Alternatively, the second approach is to adopt a local ordinance modeled after the statute, but modified to fit local circumstances and clarify the statute. Regardless of the approach taken, several procedural steps will need to be considered, such establishing procedures for consideration of variance petitions.

Once the project has been selected and the alignment determined, maps must be prepared that are suitable for filing with the county Register of Deeds Office. The map should show the proposed alignment in sufficient detail to identify the functional design and the preliminary right-of-way boundaries. Since the purpose of the map is to show the effect on properties along the project path, the existing property boundaries should be identified. As an additional requirement, within one year of the adoption of an official map, work must begin on an environmental impact study or preliminary engineering.

It is important to recognize the risks inherent in the adoption of an official map prior to completing the environmental studies. Projects to be funded using any federal funds require the unbiased evaluation of alternative alignments. This means that other alternatives will be studied and compared to the protected alignment. [1]

The above information is only to serve as an introduction to official maps, and in no way provides the information necessary to begin development of an official map. The Program and Policy Branch of the North Carolina Department of Transportation is responsible for facilitating the adoption of Official Street Maps. Cities considering Official Street Map projects should contact this Branch for their "Guidelines for Municipalities Considering Adoption of Roadway Corridor Official Maps" at:

Programming and Policy Branch
NC Department of Transportation
P.O. Box 25201
Raleigh, North Carolina 27611

Urban Renewal

Urban renewal plays a minor role in the transportation planning implementation process in terms of scope and general influence. However, under the right circumstances, renewal programs can make significant contributions. Provisions of the New Housing Act of 1974 (as amended) call for the conservation of good areas, rehabilitation of declining areas, and clearance of slum areas. In the course of renewal, it is important to coordinate with the Thoroughfare Plan to see if additional set-backs or dedication of rights-of-way are needed.

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[1] "Guidelines for Municipalities Considering Adoption of Roadway Corridor Official Maps", prepared by NCDOT Program and Policy Branch.

Continued use of urban renewal programs to improve the transportation system is encouraged. Changes that can be made under this program are generally not controversial or disruptive given the trauma of the clearance of a significant area.

Capital Improvement Programs

Capital programs are simply the coordination of planning and money. The capital improvements program, with respect to transportation, is a long range plan for the spending of money on street improvements, acquisition of rights-of-way and other improvements within the bounds of projected revenues. Municipal funds should be available for construction of street improvements which are a municipal responsibility, right-of-way cost sharing on facilities designated a Division of Highways responsibility and advance purchase of right-of-way where such action is warranted.

Historically cities and towns have depended, to a great degree, on Federal or State funding to solve their transportation problems. Chapter 136-Article 3A of the Road and Highway Laws of North Carolina clearly outlines the responsibilities and obligations of the various governmental bodies regarding highway improvements. North Carolina Highway Bill 1211, passed in 1988, limits the role of municipalities to specific limits in right-of-way cost sharing. Set-back regulations, right-of-way dedications and reservations play a major role in the ultimate cost of many facilities. Only in special cases will the municipality be able to enjoy the benefits of highway improvement without a some form of investment.

Development Reviews

Driveway access to a State-maintained street or highway is reviewed by the District Engineer's office and by the Traffic Engineering Branch of the North Carolina Department of Transportation prior to access being allowed. Any development expected to generate large volumes of traffic (ie. shopping centers, fast food restaurants, large industries, etc.) may be comprehensively studied by staff from the Traffic Engineering, Planning and Research, and Roadway Design Branches of NC DOT. If done at an early stage, it is often possible to significantly improve the development's accessibility at minimal expense. Since the municipality is the first point of contact for developers, it is important that the municipality advise them of this review requirement and cooperate in the review process.

Other Funding Sources

1. Assess user impact fees to fund transportation projects. These fees, called "facility fees" in the legislation, are to be based upon "reasonable and uniform

considerations of capital costs to be incurred by the town as a result of new construction. The facility fee must bear a direct relationship to additional or expanded public capital costs of the community service facilities to be rendered for the inhabitants, occupants of the new construction, or those associated with the development process".

2. Enact a bond issue to fund street improvements.

3. Continue to work with NCDOT to have local projects included in the Transportation Improvement Program (TIP).

4. Consider the possibility of specific projects qualifying for federal demonstration project funds.

5. Adopt a collector street plan that would assess buyer or property owners for street improvement.

6. Charge a special assessment for utilities; for example, increase water and sewer bills to cover cost of street improvements.

APPENDIX A

Typical Cross Sections

Typical cross sections recommended by the Thoroughfare Planning Unit are shown in Appendix A, Figure 7, and listed in Appendix A, Table 4.

Cross section "A" is illustrative for controlled access freeways. The 46 foot grassed median is the least desirable median width, but there could be some variation from this depending upon design considerations. Slopes of 8:1 into 3 foot drainage ditches are desirable for traffic safety. Right-of-way requirements would typically vary upward from 250 feet depending upon cut and fill requirements.

Cross section "B" is typical for four lane divided highways in rural areas which may have only partial or no control of access. The minimum median width for this cross section is 30 feet, but a wider median is desirable. Design requirements for slopes and drainage would be similar to cross section "A", but there may be some variation from this depending upon right-of-way constraints.

Cross section "C", seven lane urban, and cross section "D", five lane urban, are typical for major thoroughfares where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

Cross sections "E" and "F" are used on major thoroughfares where left turns and intersecting streets are not as frequent. Left turns would be restricted to a few selected intersections.

Cross section "G" is recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 feet is recommended with 30 feet being desirable.

Typical cross section "H" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would probably be required at major intersections.

Thoroughfares which are proposed to function as one-way traffic carriers would typically require cross section "I". Cross section "J" and "K" are usually recommended for minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross section "J" would be used on those minor thoroughfares where parking on both sides is needed as a result of more concentrated development.

Cross section "L" is used in rural areas or for staged construction of a wider multilane cross section. On some thoroughfares projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time.

The curb and gutter urban cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk further away from the street to provide added separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

Rights-of-way shown for the typical cross sections are the minimum rights-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

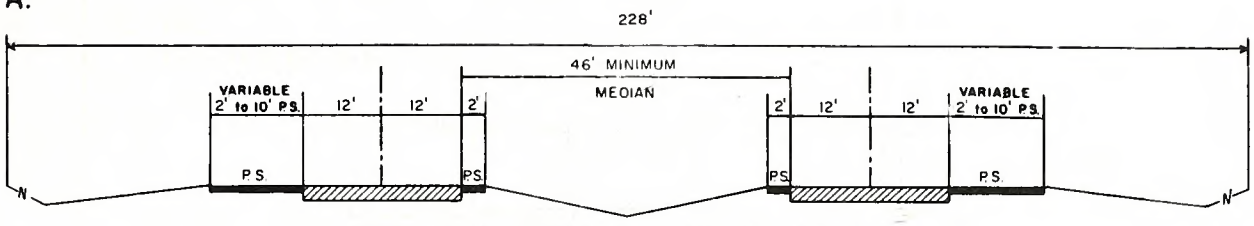
If there is sufficient bicycle traffic along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to allow for the bicycle facilities. The North Carolina Bicycle Facility and Program Handbook should be consulted for design standards for bicycle facilities.

Recommended typical cross sections for thoroughfares were derived on the basis of projected traffic, existing capacities, desirable levels of service and available right-of-way.

FIGURE 6

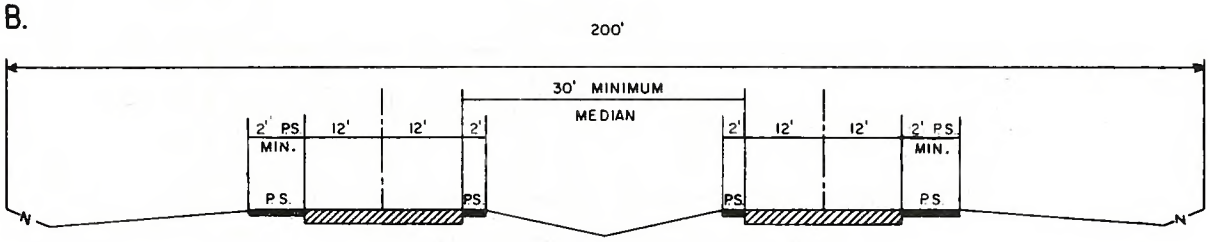
TYPICAL THOROUGHFARE CROSS SECTIONS

A.



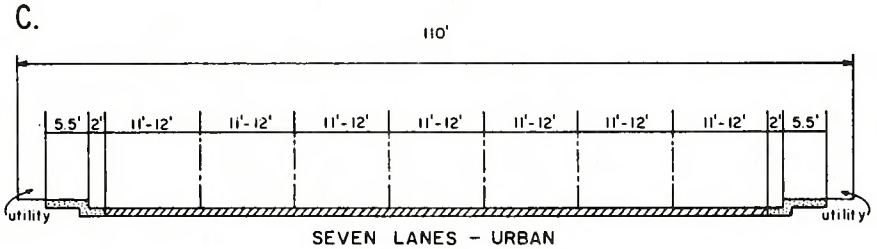
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



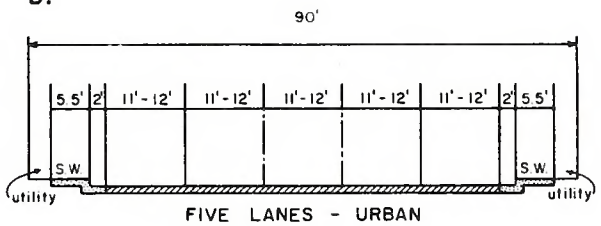
FOUR LANES DIVIDED WITH MEDIAN - RURAL

C.



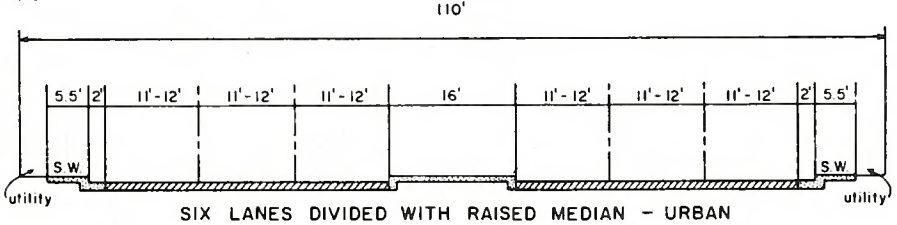
SEVEN LANES - URBAN

D.



FIVE LANES - URBAN

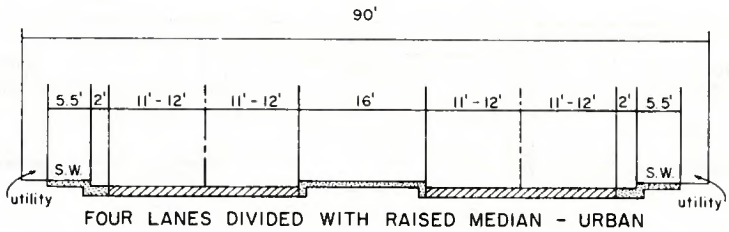
E.



SIX LANES DIVIDED WITH RAISED MEDIAN - URBAN

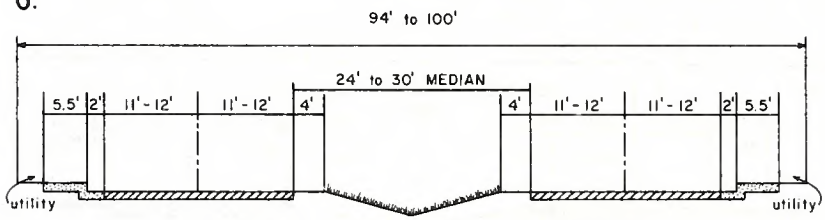
TYPICAL THOROUGHFARE CROSS SECTIONS
(CONTINUED)

F.



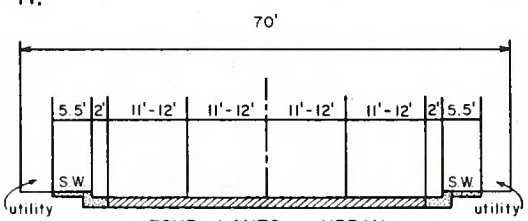
FOUR LANES DIVIDED WITH RAISED MEDIAN - URBAN

G.



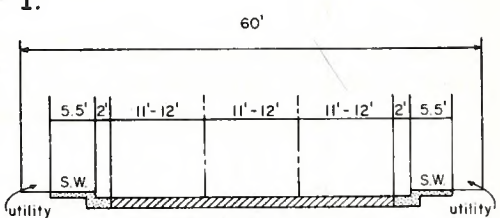
FOUR LANES DIVIDED - URBAN BOULEVARD
GRASS MEDIAN

H.



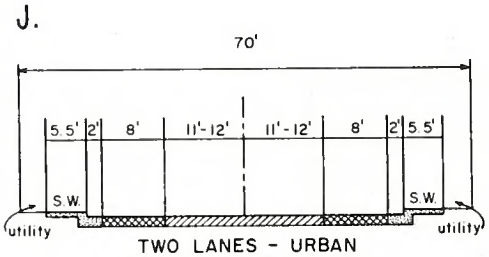
FOUR LANES - URBAN

I.



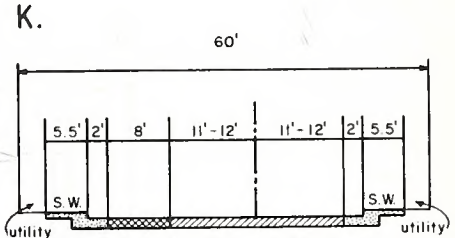
THREE LANES - URBAN

J.



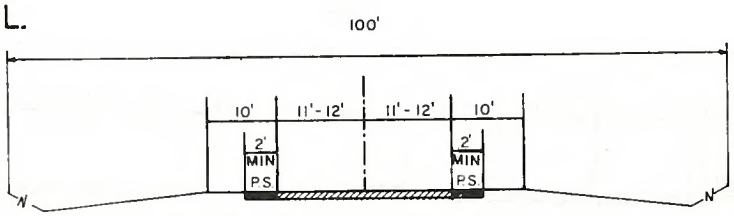
TWO LANES - URBAN
PARKING ON EACH SIDE

K.



TWO LANES - URBAN
PARKING ON ONE SIDE

L.



TWO LANES - RURAL

TABLE 4
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION DIST MI	RDWY FT	ROW FT	CAPACITY CURRENT (FUTURE)	VOLUMES ADT 1988	2015	RECOMMENDED X - SECTION RDWAY (ULT)	ROW (ULT)
US 701								
Planning Boundary - SR 1305	0.13	24	150	9,000	3,700	8,400	ADQ	ADQ
SR 1305 - NC 904	0.52	24	150	9,000	3,900	12,500	G	ADQ
NC 904 - Avon St	1.00	24	150	9,000	4,500	10,200	G	ADQ
Avon St - US 701 Bus	0.32	24	150	9,000	4,000	10,200	G	ADQ
US 701 Bus - SR 1151	0.19	24	150	9,000	7,400	18,700	G	ADQ
US 701 Business								
Planning Boundary - NC Line	0.10	24	NA	9,000	2,400	4,700	ADQ	--
NC Line - NC 410 (Greensea St)	0.78	42	NA	8,500	4,000	7,100	ADQ	--
NC 410 - Fourth St	0.08	46	NA	8,500	4,000	7,100	ADQ	--
Fourth St - NC 904	0.05	70	NA	8,500	4,000	7,100	ADQ	--
NC 904 - Wall St	0.12	46	NA	8,500	5,800	10,300	I	60
Wall St - Waccamaw St	0.56	38	NA	8,500	6,800	16,100	I	60
Waccamaw St - US 701	0.35	24	60	9,000	5,700	13,500	I	ADQ
NC 410 (Greensea St)								
Planning Boundary - NC Line	0.66	24	150	9,000	2,100	7,600	ADQ	--
NC Line - US 701 Bus	0.53	42	NA	8,500	2,100	7,600	ADQ	--
NC 904 (Eighth St, Fifth St, Pireway Rd, and Watering St)								
Planning Boundary - SR 1303	0.73	22	60	8,200	2,500	5,600	I	ADQ
SR 1303 - Eighth St	0.24	44	60	8,500	2,500	4,600	I	ADQ
Eighth St - SR 1304	0.21	44	60	8,500	2,000	3,800	I	ADQ
SR 1304 - Fifth St (US 701 Bus)	0.31	30	60	9,000	5,800	11,000	I	ADQ
US 701 Bus - Pireway St	COMMON WITH US 701 BUSINESS							
Pireway St - Bell St	0.45	30	60	9,000	2,000	9,400	I	ADQ
Bell St - US 701	0.30	20	60	7,300	2,900	7,600	I	ADQ
US 701 - SR 1305	0.39	20	60	7,300	2,200	5,800	I	ADQ
SR 1305 - Planning Boundary	0.11	20	60	7,300	3,000	5,800	I	ADQ
Avon Street								
US 701 Bus - US 701	0.17	18	NA	6,200	NA	----	---	--
Bell Street								
US 701 Bus - Pireway St	0.34	18	NA	6,200	1,900	3,600	ADQ	--

ADQ - ADEQUATE
NA - NOT AVAILABLE

TABLE 4
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION DIST MI	RDWY FT	ROW FT	CAPACITY CURRENT (FUTURE)	VOLUMES ADT 1988	2015	RECOMMENDED X - SECTION RDWAY (ULT)	ROW (ULT)
Eighth Street								
NC 904 - Stake Rd	0.25	20	NA	7,300	2,500	2,700	ADQ	--
Stake Rd - NC 701 Bus	0.18	--	--	(9,000)	1,800	3,400	K	60
(also see NC 904)								
Fifth Street								
(See NC 904)								
Fourth Street								
Lewis St - Orange St	0.22	33	NA	8,500	NA	----	---	--
Orange St - NC 904	0.17	20	NA	7,300	NA	----	---	--
Greensea Street								
(See NC 410)								
Lewis Street (SR 1301)								
Watering St - Sixth St	0.24	20	NA	7,300	1,200	2,400	ADQ	--
Sixth St - Greensea St	0.35	18	NA	6,200	1,200	2,400	ADQ	--
NW Corridor								
SR 1304 - NC 904	0.62	--	--	(12,500)	----	1,400	L	100
NC 904 - School St	0.26	--	--	(12,500)	----	1,600	L	100
Pireway Road								
(See NC 904)								
School Street								
SR 1303 - Sixth St	0.45	20	60	7,300	200	3,100	ADQ	--
Sixth Street (SR 1301)								
School St - Lewis St	0.84	18	NA	6,200	1,500	3,000	ADQ	--
Lewis St - Pireway St	0.14	18	NA	6,200	1,200	2,400	ADQ	--
SR 1304								
Eighth St - Planning Boundary	0.81	18	60	6,200	500	3,100	ADQ	--
SR 1305								
Prop SW Corridor - US 701 Bus	0.10	20	NA	7,300	1,500	2,400	ADQ	--
US 701 Bus - NC 904	0.60	20	NA	7,300	1,500	2,900	ADQ	--
SR 1306								
Stake Rd - SR 1304	0.37	20	NA	7,300	500	1,000	ADQ	--

ADQ - ADEQUATE
NA - NOT AVAILABLE

TABLE 4
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION DIST MI	RDWY FT	ROW FT	CAPACITY CURRENT (FUTURE)	VOLUMES ADT 1988	2015	RECOMMENDED X - SECTION RDWAY (ULT)	ROW (ULT)
Stake Road (SR 1300)								
US 701 Bus - Eighth St	0.23	24	40	9,000	1,200	2,300	ADQ	--
Eighth St - SR 1367	0.65	36	60	9,500	2,600	5,000	ADQ	--
SR 1367 - Planning Boundary	0.23	18	NA	6,200	2,600	5,000	ADQ	--
SW Corridor								
School St - NC Line	0.25	--	--	(12,500)	----	3,000	L	100
NC Line - Greensea St	0.45	--	--	(12,500)	----	3,000	L	100
Greensea St - SR 1305	0.41	--	--	(12,500)	----	2,400	L	100
Watering Street (See NC 904)								
Williams Street								
US 701 Bus - Live Oak Ave	0.27	18	NA	6,200	NA	4,400	K	60
Live Oak Ave - US 701	0.29	--	--	(9,000)	----	4,400	K	60

ADQ - ADEQUATE
NA - NOT AVAILABLE

APPENDIX B

RECOMMENDED SUBDIVISION ORDINANCES

DEFINITIONS

I. Streets and Roads:

A. Rural Roads

1. Principal Arterial - A rural link in a highway system serving travel, and having characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of Interstate routes and other routes designated as principal arterials.

2. Minor Arterial - A rural roadway joining cities and larger towns and providing intra-state and inter-county service at relatively high overall travel speeds with minimum inter-ference to through movement.

3. Major Collector - A road which serves major intra-county travel corridors and traffic generators and provides access to the Arterial system.

4. Minor Collector - A road which provides service to small local communities and traffic generators and provides access to the Major Collector system.

5. Local Road - A road which serves primarily to provide access to adjacent land, over relatively short distances.

B. Urban Streets

1. Major Thoroughfares - Major thoroughfares consist of Inter-state, other freeway, expressway, or parkway roads, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.

2. Minor Thoroughfares - Minor thoroughfares perform the function of collecting traffic from local access streets and carrying it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thorough-fare system by facilitating minor through-traffic movements and may also serve abutting property.

3. Local Street - A local street is any street not on a higher order urban system and serves primarily to provide direct access to abutting land.

C. Specific Type Rural or Urban Streets

1. Freeway, expressway, or parkway - Divided multilane roadways designed to carry large volumes of traffic at high speeds. A freeway provides for continuous flow of vehicles with no direct access to abutting property and with access to selected crossroads only by way of interchanges. An expressway is a facility with full or partial control of access and generally with grade separations at major intersections. A parkway is a for non-commercial traffic, with full of partial control or access.

2. Residential Collector Street - A local street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.

3. Local Residential Street - Cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.

4. Cul-de-sac - A short street having only one end open to traffic and the other end being permanently terminated and a vehicular turn-around provided.

5. Frontage Road - A road that is parallel to a partial or full access controlled facility and provides access to adjacent land.

6. Alley - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

II. Property

A. Building Setback Line - A line parallel to the street in front of which no structure shall be erected.

B. Easement - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.

C. Lot - A portion of a subdivision, or any other parcel of land, which is intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".

III. Subdivision

A. Subdivider - Any person, firm, corporation or official agent thereof, who subdivides of develops any land deemed to be a subdivision.

B. Subdivision - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, immediate or future, of sale or building development and all divisions of land involving the dedication of a new street or change in existing streets; provided, however, that the following shall not be included within this definition nor subject to these regulations: (1) the combination or recombination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein; (2) the division of land into parcels greater than ten acres where no street right-of-way dedication is involved, (3) widening of opening of streets; (4) the division of a tract in single ownership whose entire area is no greater than two acres into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

C. Dedication - A gift, by the owner, of his property to another party without any consideration being given for the transfer. The dedication is made by written instrument and is completed with an acceptance.

D. Reservation - Reservation of land does not involve any transfer of property rights. It constitutes an obligation to keep property free from development for a stated period of time.

DESIGN STANDARDS

I. Streets and Roads

The design of all roads within Plymouth shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway Officials' (AASHTO) manuals.

The provision of street rights-of-way shall conform and meet the recommendations of the Thoroughfare Plan, as adopted by the Town of Plymouth.

The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

A. Right-of-way Widths - Right-of-way (ROW) widths shall not be less than the following and shall apply except in those cases where ROW requirements have been specifically set out the Thoroughfare Plan.

	Min. ROW
1. Rural	
a. Principle Arterial	
Freeways	350 ft.
Other	200 ft.
b. Minor Arterial	100 ft.
c. Major Collector	100 ft.
d. Minor Collector	80 ft.
e. Local Road	60 ft.[1]
2. Urban	
a. Major Thoroughfare other than Freeway and Expressway	90 ft.
b. Minor Thoroughfare	70 ft.
c. Local Street	60 ft.[1]
d. Cul-de-sac	Variable[2]

The subdivider will only be required to dedicate a maximum of 100 feet of right-of-way. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. On all cases in which right-of-way is sought for a fully controlled access facility, the subdivider will only be required to make a reservation. It is strongly recommended that subdivisions provide access to properties from internal streets, and that direct property access to major thoroughfares, principle and minor arterials, and major collectors be avoided. Direct property access to minor thoroughfares is also undesirable.

A partial width right-of-way, not less than sixty feet in width, may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is subdivided, the remainder of the full required right-of-way shall be dedicated.

B. Street Widths - Widths for street and road classifications other than local shall be as recommended by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

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[1] The desirable minimum right-of-way (ROW) is 60 ft. If curb and gutter is provided, 50 feet of ROW is adequate on local residential streets.

[2] The ROW dimension will depend on radius used for vehicular turnaround. Distance from edge of pavement of turnaround to ROW should not be less than distance from edge of pavement to ROW on street approaching turnaround.

1. Local Residential
   Curb and Gutter section: 26 feet, face to face of curb
   Shoulder section: 20 feet to edge of pavement, 4 foot shoulders

2. Residential Collector
   Curb and Gutter section: 34 feet, face to face of curb
   Shoulder section: 20 feet to edge of pavement, 6 foot shoulders

C. Geometric Characteristics - The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under Right-of-Way shall apply.

1. Design Speed - The design speed for a roadway should be a minimum of 5 mph greater than the posted speed limit. The design speeds for subdivision type streets shall be:

DESIGN SPEEDS

Facility Type	Design Speed		
	Desirable	Minimum	
		Level	Rolling
RURAL			
Minor Collector Roads	60	50	40
Local roads including Residential Collectors and Local Residential	50	50[1]	40[1]
URBAN			
Major Thoroughfares other than Freeway or Expressway	60	50	50
Minor Thoroughfares	60	50	40
Local Streets	40	40[2]	30[2]

[1] Based on projected annual average daily traffic of 400-750. In cases where road will serve a limited area and small number of dwelling units, minimum design speeds can be reduced further.

[2] Based on projected annual average daily traffic of 50-250.

2. Maximum and Minimum Grades

a. The maximum grades in percent shall be:

MAXIMUM VERTICAL GRADE		
Design Speed	Terrain Level	Rolling
60	4	5
50	5	6
40	6	7
30		9

b. Minimum grade should not be less than 0.5% .

c. Grades for 100 feet each way from intersections (measured from edge of pavement) should not exceed 5%.

d. For streets and roads with projected annual average daily traffic less than 250, short grades less than 500 feet long, may be 150% of the value in the above table.

3. Minimum Sight Distance - In the interest of public safety, no less than the minimum sight distance applicable shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters:

SIGHT DISTANCE				
Design Speed	30	40	50	60
Stopping Sight Distance				
Minimum (ft.)	200	275	400	525
Desirable Minimum (ft.)	200	325	475	650
Minimum K[1] Value for:				
Crest curve	30	80	160	310
Sag curve	40	70	110	160

(General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case.)

[1] K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet of the vertical curve which will provide the desired sight distance.

Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1984".

4. The "Superelevation Table" below shows the maximum degree of curve and related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter of 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.

SUPERELEVATION TABLE

Design Speed	Maximum e*	Minimum Radius ft.	Max. Deg. of Curve.
30	0.04	302	19 00′
40	0.04	573	10 00′
50	0.04	955	6 00′
60	0.04	1,528	3 45′
30	0.06	273	21 00′
40	0.06	509	11 15′
50	0.06	849	6 45′
60	0.06	1,380	4 15′
30	0.08	252	22 45′
40	0.08	468	12 15′
50	0.08	764	7 30′
60	0.08	1,206	4 45′

e* = rate of roadway superelevation, foot per foot

D. Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty-five (65) degrees.

2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.

3. Off-set intersections are to be avoided. Intersections which cannot be aligned should be separated by a minimum length of 200 feet between survey centerlines.

E. Cul-de-sacs

Cul-de-sacs shall not be more than seven hundred (700) feet in length. the distance from the edge of pavement on the vehicular turnaround to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turnaround. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

F. Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provision is make for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.

2. The width of an alley shall be at least twenty (20) feet.

3. Deadend alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turnaround facilities at the deadend as may be required by the Planning Board.

G. Permits For Connection To State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the District Engineer of the Division of Highways.

H. Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet from the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 6 feet from the face of curb.

I. Wheel Chair Ramps

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

J. Horizontal Width on Bridge Deck

1. The clear roadway widths for new and reconstructed bridges serving 2 lane, 2 way traffic should be as follows:

   a. Shoulder section approach

      i. Under 800 ADT design year

         Minimum 28 feet width face to face of parapets of rails or pavement width plus 10 feet, whichever is greater.

      ii. 800 - 2000 ADT design year

         Minimum 34 feet width face to face of parapets of rails or pavement width plus 12 feet, whichever is greater.

      iii. Over 2000 ADT design year

         Minimum width of 40 feet, desirable width of 44 feet width face to face of parapets or rails.

   b. Curbs and gutter approach

      i. Under 800 ADT design year

         Minimum 24 feet face to face of curbs.

      ii. Over 800 ADT design year

         Width of approach pavement measured face to face of curbs.

         Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face of curbs, and in crown drop. The distance from face of curb to face of parapet or rail shall be 1'6" minimum, or greater if sidewalks are required.

2. The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:

   a. Shoulder section approach - Width of approach pavement plus width of usable shoulders on the approach left and right. (Shoulder width 8' minimum, 10' desirable.)

   b. Curb and gutter approach - Width of approach pavement measured face to face of curbs.

Date Due

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